DOCUMENT RESUME

ED 177 933 HE 011 616

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TITLE Recruitment and Retention of Black Americans in Engineering at Purdue. 4. A Follow-Up Study of Black Engineering Graduates.
INSTITUTION Purdue Univ., Lafayette, Ind.
SPONS AGENCY National Science Foundation, Washington, D.C.
GRANT GY-11125
NOTE 49p.; For related document see HE 011 615
AVAILABLE FROM Engineering Education Research Studies, Dept. of Freshman Engineering, Purdue University, West Lafayette, IN 47907

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS *Blacks; *Career Choice; Degrees (Titles); Educational Quality; *Engineering Education; Followup Studies; *Graduate Surveys; Higher Education; Institutional Characteristics; *Job Satisfaction; Professional Education; Salaries
IDENTIFIERS *Purdue University IN

ABSTRACT

Post-college activities of Black U.S. graduates who studied engineering are the topic of this monograph, the last in a series of four reports examining Black engineering students at Purdue University. Black American B.S. degree recipients who studied engineering between 1938-1974 were surveyed. Advanced educational plans, type of employment, and retrospective views of careers and education were investigated. Most of the graduates held high level technical and supervisory jobs in engineering and allied fields. Salaries were above the national average for engineers with comparable experience. Over 80 percent of the Black graduates were satisfied with their choice of engineering careers and Purdue Engineering. Laboratory and mathematics courses including both practical and theoretical courses were given especially high ratings. The results indicate that at the time of the survey (1974), Purdue engineering graduates had, and were continuing to pursue, advanced graduate and professional education. They held substantial positions of responsibility in both technical and managerial fields. They were achieving higher than average salaries and generally were quite satisfied with their jobs, careers, choice of engineering, and Purdue. The survey instrument is appended. (Author/SF)

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RECRUITMENT AND RETENTION OF BLACK AMERICANS IN ENGINEERING AT PURDUE

4. A FOLLOW-UP STUDY OF BLACK ENGINEERING GRADUATES [1]

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ABSTRACT

Ninety-eight Black American B.S. degree graduates who studied engineering between 1938-74 at Purdue Univers' were sent mail questionnaires in 1974 and 64% returned them. Over 90% of the black engineering alumni planned additional education at the M.S. degree or higher and over 40% had been awarded the Master's degree or higher. Most of the graduates held high level technical and supervisory jobs in engineering and allied fields; 90% were very satisfied or satisfied with their jobs; their median annual salary was $18,000 and ranged from $7,000 to over $50,000. Salaries were above the national average for engineers with comparable experience. Over 80% of the black graduates were satisfied with their choice of engineering careers and Purdue Engineering, laboratory and mathematics courses including both practical and theoretical courses were given especially high ratings. The black engineering alumni especially the 1938-66 graduates were more often dissatisfied with some aspects of campus life including dating, counseling services, social life, tutorial services and opportunities to pursue black studies; however, recent graduates (1967-74)

[1] This study was conducted under Grant GY 11125 from the National Science Foundation to Purdue Research Foundation. The views represented in this report are those of the authors and do not necessarily reflect those of NSF or Purdue University.

seem to be more satisfied with these aspects. Over 90% indicated liking the type of work and interest in problem solving as important considerations in their decision to study engineering. Over 90% indicated the academic quality, prestige and type of academic program in engineering as the primary reasons for their decision to attend Purdue.

The results indicate that at the time of the survey (1974), Purdue engineering graduates had and were continuing to pursue advanced graduate and professional education. They held substantial positions of responsibility in both technical and managerial fields. They were achieving higher than average salaries and generally were quite satisfied with their jobs, careers and choice of engineering and Purdue.

A FOLLOW-UP STUDY OF BLACK ENGINEERING GRADUATES[1]

William K. LeBold, Arthur Bond and Majoice Thomas

Purdue University

I. Introduction

This is the fourth and last of four monographs prepared as part of a comprehensive study of the factors associated with attracting and retaining Black Americans in engineering at Purdue. The initial report was concerned with trends and statistical analyses; the second with a study of the expectations of 1974 Purdue engineering freshmen regarding college, Purdue and engineering. The third monograph was concerned with Black Americans who had begun in engineering between 1966-76 and were persisting in engineering, who had transferred to other fields at Purdue or had withdrawn from Purdue. In this monograph, focus is given to the post-college activities of black B.S. graduates who studied engineering with primary emphasis on their advanced educational plans and pursuits, their initial and 1974 jobs and their retrospective views of their careers, engineering and campus life at Purdue.

II. Purpose and Objectives

The Follow-Up Study of Black Engineering Graduates was conducted in 1974 to provide information about the college and post-college experiences of Black American Purdue B.S. graduates who studied engineering between 1938 and 1974.

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The general objectives of the alumni study were as follows:

1. To provide information about the extent and nature of their graduate and advanced education.
2. To provide information about their first full-time jobs held after college and their present jobs.
3. To examine factors which influenced their decisions to study engineering and attend Purdue.
4. To determine their degree of satisfaction with Purdue, their careers and various aspects of their campus life.

III. Method

A mail questionnaire was sent to all known Black American Purdue B.S. engineering graduates and to those Black Americans who had studied engineering at Purdue between 1966-74, but had received their B.S. degree in a non-engineering field. Two follow-up letters with questionnaires were used. As a final follow-up procedure, mailgrams sought responses with an invitation to respond "collect" by telephone or "day letter". Copies of the questionnaire, cover and follow-up letters are given in Appendix A. The returns are summarized in Table 1.

TABLE 1

PERCENTAGE AND NUMBER OF RETURNS IN 1974
PURDUE BLACK ENGINEERING ALUMNI SURVEY

	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	TOTAL 1967-74
No. Sent	98	79	19	45	34	53
No. Received	63	50	13	27	23	36
% Returned	64%	63%	68%	60%	63%	68%

A total of 63 alumni responded to the survey, or 64% of the 98 questionaires that were mailed. There was a total of 50 engineers and 13 non-engineers among the respondents. Engineers were defined as those persons receiving a B.S. degree in engineering and non-engineers being those who began in engineering but received a Purdue B.S. degree in an area other than engineering. All but one, who graduated in 1938, graduated after 1945. In much of the discussion that follows, contrast will be made between earlier engineering graduates (1938-66) and recent engineering graduates (1967-74) but the tables include data for the total respondents and non-engineering graduates as well. Most of the tables are reported in percentages to facilitate comparisons between groups, using as a base the number responding, which is also provided. Since the number in each subgroup is small, caution should be used in making comparisons between groups.

IV. Graduate and Advanced Education Results

Table 2 provides a detailed analysis of the highest educational level achieved or planned by Purdue Black American graduates who studied engineering for the total group and various subgroups. To the item or current educational level, 57 of the total engineering and non-engineering graduates responded; 28% indicated they had done no additional work, beyond the bachelor's degree; 30% had done some graduate work but had not earned an advanced degree; 23% had received the master's degree in addition to 5% who had also done some work on the doctorate and 11% had received the doctorate; 4% had achieved other types of additional education. As would be expected a higher percentage of the 1938-66 engineering graduates had already achieved the M.S. degree or higher in contrast to the

TABLE 2

HIGHEST EDUCATIONAL LEVEL ACHIEVED OR PLANNED BY PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

CURRENT EDUCATIONAL LEVEL	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
B.S. Degree (no additional work)	28	27	41	16	41	46
B.S. Degree (some grad. work)	30	30	25	32	27	29
M.S. Degree (no additional work)	23	25	8	32	18	15
M.S. Degree (some work on Doctorate)	5	6	0	8	5	6
Doctorate	11	9	17	12	5	4
Other	4	2	8	0	5	NA
Total No. of Cases	(57)	(46)	(11)	(25)	(21)	(1613)
PLANNED EDUCATIONAL LEVEL						
B.S. Degree (no additional work)	4	5	0	7	4	
B.S. Degree (some grad. work)	2	3	0	0	4	
M.S. Degree (no additional work)	47	47	44	47	46	
M.S. Degree (some work on Doctorate)	19	18	22	20	17	
Doctorate	13	13	11	13	13	
Other	15	13	22	13	17	
Total No. of Cases	(47)	(38)	(9)	(14)	(24)	

See Item 2, Appendix A for exact wording of the item.

1967-74 engineering graduates (52% compared to 33%). Eleven percent of the total and 9% of the engineering graduates had already achieved the doctorate.

Table 2 also provides data on the last previous comprehensive survey of Purdue B.S. graduates in 1965 (Perrucci and LeBold, 1967). Although almost 10 years have elapsed since that survey, it still provides comparative information. The 1965 survey data presented is based on (1947-65) B.S. engineering graduates. Table 2 indicates the educational level of achievement of Purdue Black American graduates in 1974 was higher than that reported by B.S. engineers surveyed graduates in 1966, but the earlier 1938-66 Black American engineering graduates had very similar distributions of educational levels to those of Purdue B.S. graduates when surveyed a decade earlier.

The planned degree aspirations of the two groups - earlier engineering alumni and the more recent alumni were quite high, 94% aspiring to achieve the master's degree or higher; 47% of the total and the engineering graduates planned to make the master's degree a terminal one. However, an additional 32% planned to eventually pursue work beyond the master's degree including 13% who aspired to achieve the doctorate degree, and an additional 15% who eventually planned to achieve other degrees (law, medicine, etc).

On examining the major field of study at the undergraduate level in Table 3, it may be noted that 20% of the earlier graduates chose electrical engineering compared to 48% of the recent graduates. Table 3 also reflects the tendency of Purdue engineering graduates to pursue non-engineering advanced degrees, especially the earlier graduates who were just as likely to pursue their master degrees and doctorates in non-

TABLE 3

MAJOR ACADEMIC FIELD BY DEGREE FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974
(IN PERCENTAGES)

MAJOR FIELD AS UNDERGRADUATE	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Aeronautical/Astronautical	8	8	8	12	4	13
Chemical	8	10	0	16	4	9
Civil	11	14	0	20	8	12
Electrical	31	34	17	20	48	13
Industrial	8	8	8	0	16	4
Mechanical	16	20	0	32	8	12
Materials and Metallurgy	2	2	0	0	4	2
Other Engineering	3	4	8	0	8	10
Other Non-Engineering	11	0	58	0	0	5
Total No. of Cases	(62)	(50)	(12)	(25)	(25)	(1570)
MAJOR FIELD AS MASTERS						
Aeronautical/Astronautical	6	4	17	6	0	5
Chemical	6	7	0	6	11	9
Civil	9	11	0	11	11	23
Electrical	18	19	17	17	22	24
Industrial	3	4	0	0	11	6
Mechanical	3	4	0	6	0	19
Materials and Metallurgy	3	4	0	0	11	0
Other Engineering	3	4	0	6	0	11
Other Non-Engineering	48	44	67	50	33	2
Total No. of Cases	(33)	(27)	(6)	(18)	(9)	(285)

TABLE 3
(Con't)

MAJOR ACADEMIC FIELD BY DEGREE FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974
(IN PERCENTAGES)

MAJOR FIELD AS DOCTORATE	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Aeronautical/Astronautical	9	0	50	0	0	2
Chemical	0	0	0	0	0	8
Civil	9	11	0	0	25	13
Electrical	18	22	0	20	25	8
Industrial	9	0	50	0	0	3
Mechanical	0	0	0	0	0	39
Materials and Metallurgy	9	11	0	20	0	3
Other Engineering	0	0	0	0	0	5
Other Non-Engineering	45	56	0	60	50	3
Total No. of Cases	(11)	(9)	(2)	(5)	(4)	(292)

See Item 3, Appendix A for exact working of the item.

engineering fields as engineering. Some caution should be used in interpreting the advanced degree data in Table 3 in view of the fact that only 33 of 63 graduates responded to the master's degree field item and only 11 to the doctorate field question.

V. Marital Status

Table 4 indicates as might be expected the longer the alumnus had been out of school, the more likely he was to be married. This is evidenced by the fact that 72% of the earlier graduates were married and only 48% of the more recent graduates were married at the time of the survey. Likewise, earlier graduates are more likely to have children. Both trends seem to be consistent with national trends in the general population, but the percentage that are single is higher and the number of children smaller than for previous surveys of Purdue engineering graduates. In the last comprehensive survey of Purdue engineering graduates in 1965 (Perrucci and LeBold, 1967) 86% were married compared to 61% in this survey; 1% compared to 5% in this survey were separated, divorced or widowed; and only 13% in 1965 vs. 34% in this 1974 survey were single. Twenty-one percent of the Purdue B.S. graduates reported in 1964 having no children compared to 52% in the current survey. These data suggest that black engineering graduates in general are less likely to be married and have children than engineering graduates in general, and this is especially true with regard to recent graduates.

VI. Initial and Current Employment

Table 5 provides insight into the level of supervisory responsibility of black engineering graduates in the first job after receiving

TABLE 4

MARITAL AND FAMILIAL STATUS OF PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974
(IN PERCENTAGES)

MARITAL STATUS	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Single	34	34	33	24	44	13
Married	61	60	67	72	48	86
Separated	3	4	0	0	4	1
Divorced	2	2	0	0	4	1
Widowed	0	0	0	0	0	1
Total No. of Cases	(62)	(50)	(12)	(25)	(25)	(1624)
NUMBER OF CHILDREN						
No Children	52	48	67	26	68	21
One Child	15	14	17	15	16	15
Two Children	18	18	17	26	12	27
Three or More Children	16	20	0	33	4	38
Total No. of Cases	(62)	(50)	(12)	(25)	(25)	(1560)

See Items 7 and 8, Appendix A for exact wording of the item.

TABLE 5

FIRST AND PRESENT JOB DEGREE OF SUPERVISORY RESPONSIBILITY FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

FIRST JOB SUPERVISORY RESPONSIBILITY	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
No Supervisory Responsibility	65	61	82	76	46	70
Supervision of Non-Tech. Personnel	12	14	0	12	17	14
Supervision of Technical Personnel	13	14	9	12	17	7
Supervision of Tech. and Non-Tech.	7	6	9	0	13	6
Supervision of Professional Personnel	2	2	0	0	4	1
Supervision of Lower and Middle Management Personnel	2	2	0	0	4	1
Responsible Only to Highest Admins. Office or Hold Highest Admins.	0	0	0	0	0	1
Total No. of Cases	(60)	(49)	(11)	(25)	(24)	(1361)
CURRENT JOB SUPERVISORY RESPONSIBILITY						
No Supervisory Responsibility	30	23	60	9	39	28
Supervision of Non-Tech. Personnel	12	10	20	9	11	13
Supervision of Technical Personnel	8	8	10	5	11	8
Supervision of Tech. and Non-Tech.	6	8	0	0	17	14
Supervision of Professional Personnel	10	13	0	23	0	19
Supervision of Lower and Middle Management Personnel	12	13	10	14	11	7
Responsible Only to Highest Admins. Office of Hold Highest Admins.	22	28	0	41	11	12
Total No. of Cases	(50)	(40)	(10)	(22)	(18)	(1538)

See Items 14 and 15, Scale C in Appendix A for a more complete description of the scale and instruction.

the B.S. and then the (1974) current job. Over half (65%) of the total black graduates had no supervisory responsibilities in their initial, and only 30% reported so in their present job.

Seventy-six percent of the 25 indicated that they had no supervisory responsibility in their first full-time job held after college compared to only 9% in their 1974 job; 24% supervised non-technical and/or technical personnel initially vs. 14% in 1974 and 0% had supervision over professional or managerial personnel in their first full-time job after college compared to 78% in their current (1974) position. The corresponding percentages for engineering graduates between 1967 and 1974 were: 46% had no supervisory responsibility compared to 39% in their current job, 47% supervised technical and/or non-technical personnel initially compared to 39% in present job, 8% supervised professional or managerial personnel in their first full-time job after college compared to 22% presently. Table 5 also indicates that the black engineering graduates surveyed in 1974 reported higher supervisory responsibilities in both first job after B.S. and current job than engineering graduates surveyed a decade earlier reported, especially at the higher levels in current jobs. These data suggest that opportunities have expanded over recent years enabling black engineers to move into positions of high supervisory responsibility. Although neither the earlier nor the more recent graduate was responsible only to highest administrative office or held the highest administrative office in their first full-time job after college, the data on supervisory responsibility for current job held indicated that 41% of early graduates and 11% of the recent graduates held these top level positions. These data further support the relatively high levels of supervisory responsibilities held

by Purdue black engineering graduates in contemporary society.

Technical responsibilities on initial and current jobs show a similar increase as may be seen in Table 6. When respondents were asked to indicate the level of technical knowledge best describing their first and present job, about one-half of the engineering graduates indicated that a good (17%), thorough (26%) or extensive (8%) technical knowledge was required in their first job and 88% stated such levels of knowledge were required in their current job. In both current job and initial job, black graduates in 1974 reported higher levels of technical responsibilities than their peers reported when the latter were surveyed in 1965.

Still further support of the fact that recent graduates receive greater responsibilities initially and the fact that the longer they work the greater the administrative responsibilities can be found in Table 7. Virtually all (96%) of the 1938-66 engineers reported they worked in an entirely (64%) or primarily (32%) technical area in their first job, but only one-fifth worked entirely (5%) or primarily (14%) in a technical area in their current job. Over half of the 1967-74 black engineering graduates in their first job reported half or primarily administrative responsibilities compared to 20% of the graduates surveyed in 1965 and 4% of the 1938-66 black engineering graduates.

Research (2%), development (24%) and design (20%) described half of the black engineering graduates principal job functions in their first job with less than a quarter being in similar job functions in 1974. The primary change noted in Table 8 was the engineering management (15%) and non-engineering management (15%) compared to only 2% engineering management in the initial job of black engineering

TABLE 6

FIRST AND PRESENT JOB LEVEL OF TECHNICAL RESPONSIBILITY FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

FIRST JOB LEVEL OF TECHNICAL RESPONSIBILITY	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
No Previous Knowledge Required	4	2	10	4	0	11
Limited Backg-ound of Knwldge. of Prin.	7	2	30	4	0	13
General Knw:dge. o' Principles	14	15	10	20	9	25
Working Knwldge. of Repetitive Tasks	26	30	10	32	27	25
Good Knwldge. of Standard Guides	16	17	10	16	18	13
Thorough Knwldge. of Standard Guides	25	26	20	20	32	10
Extensive Knwldge. of Principles	9	8	10	4	14	2
Total No. of Cases	(57)	(47)	(10)	(25)	(22)	(1342)
PRESENT JOB LEVEL OF TECHNICAL RESPONSIBILITY						
No Previous Knowledge Required	2	0	11	0	0	1
Limited Background of Knowledge	4	0	22	0	0	2
General Knwldge. of Principles	4	3	11	5	0	3
Working Knwldge. of Repetitive Tasks	0	0	0	0	0	7
Good Knwldge. of Standard Guides	9	11	0	0	25	14
Thorough Knwldge. of Standard Guides	43	45	33	45	44	49
Extensive Knwldge. of Principles	28	32	11	41	19	22
Outstanding Knwldge. Specialty Area	11	11	11	9	13	2
Total No. of Cases	(47)	(38)	(9)	(22)	(16)	(1489)

See Items 14 and 15, Scale D in Appendix A for a more complete description of the scale and instruction.

TABLE 7

FIRST AND PRESENT JOB TECHNICAL-ADMINISTRATIVE FUNCTION OF PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

FIRST JOB LEVEL	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Entirely Technical	41	46	18	64	26	45
Primarily Technical	27	31	9	32	30	35
Half Technical - Half Administrative	19	17	27	4	30	10
Administrative, Technical Necessary	7	6	9	0	13	6
Administrative, Technical Unnecessary	7	0	36	0	0	4
Total No. of Cases	(59)	(48)	(11)	(25)	(23)	(1342)
PRESENT JOB LEVEL						
Entirely Technical	10	10	10	5	18	13
Primarily Technical	12	13	10	14	12	30
Half Technical - Half Administrative	22	26	10	27	24	28
Administrative, Technical Necessary	41	46	20	55	35	25
Administrative, Technical Unnecessary	14	5	50	0	12	4
Total No. of Cases	(49)	(39)	(10)	(22)	(17)	(1519)

See Items 14 and 15, Scale E in Appendix A for a more complete description of the scale and instruction.

TABLE 8

FIRST AND PRESENT JOB PRINCIPAL FUNCTION OF PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

FIRST JOB PRINCIPAL FUNCTION	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Pre-Professional	17	14	27	20	8	18
Research	2	2	0	0	4	7
Development	22	24	9	24	25	19
Design	18	20	9	24	17	16
Operations	10	8	18	12	4	7
Production	7	8	0	4	13	7
Testing	5	4	9	4	4	6
Construction	2	2	0	4	0	4
Sales and Application Engineering	3	4	0	4	4	5
Engineering Management	2	2	0	0	4	2
Non-Engineering Management	3	0	18	0	0	1
Other, Non-Engineering	10	10	9	4	17	6
Total No. of Cases	(60)	(49)	(11)	(25)	(24)	(1356)
PRESENT JOB PRINCIPAL FUNCTION						
Pre-Professional	2	0	10	0	0	2
Research	2	3	0	5	0	9
Development	16	18	10	14	22	16
Design	6	5	10	5	6	12
Operations	2	0	10	0	0	8
Production	10	10	10	0	22	6
Testing	2	3	0	5	0	3
Construction	2	3	0	0	6	3
Sales and Application Engineering	4	5	0	5	6	10
Engineering Teaching	4	5	0	0	11	3
Engineering Management	12	15	0	23	6	13
Non-Engineering Management	20	15	40	23	6	5
Other, Engineering	4	5	0	9	0	-
Other, Non-Engineering	14	15	10	14	17	7
Total No. of Cases	(50)	(40)	(10)	(22)	(18)	(1514)

See Items 14 and 15, Scale F in Appendix A for a more complete description of the scale and instruction.

graduates. An additional 15% reported other non-engineering job functions.

In Table 9 a distribution by job field is shown for first job held and present job. The principal area of initial employment corresponds closely with the undergraduate major field. For engineering graduates electrical engineering had the highest concentration (22%), mechanical engineering (16%) was next, followed by civil engineering (14%). On examining present job fields, the emphasis shifted from electrical to non-engineering and business fields. Forty-one percent of the engineering graduates were employed in a non-engineering area (including physical science, mathematics, business and other non-engineering fields), almost twice as high as reported in the 1965 survey of B.S. engineering graduates (21%).

Table 10 summarizes the relevance expressed by black graduates of having an engineering background for their initial job after graduating and their current (1974) job. Earlier engineering graduates seem to feel engineering more necessary in both their first job and current job than recent graduates, 56% of the earlier black alumni felt that engineering was a "must" in their first job and 41% in their current job, but only 21% of the more recent black graduates felt that way about their initial job and only 17% about their current job. Few of the black graduates felt that an engineering background was unnecessary, except for the non-engineering black graduates and even among those, only less than half (45%) felt engineering was unnecessary in their initial job and 60% with regard to their 1974 employment.

Only a small percentage of the respondents indicated dissatisfaction with their first full-time job or their present job as shown in

TABLE 9

ENGINEERING/SCIENCE FIELD IN WHICH FIRST AND PRESENT JOB PRINCIPALLY ENGAGED FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

FIRST JOB FIELD	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Aeronautical Engineering	8	8	9	12	4	13
Civil Engineering	12	14	0	16	13	11
Chemical Engineering	7	8	0	12	4	7
Electrical Engineering	20	22	9	20	25	9
Industrial Engineering	5	4	9	4	4	4
Mechanical Engineering	13	16	0	28	4	13
Engineering, General and Specialties	10	8	18	4	13	33
Physical Sciences or Mathematics	2	2	0	4	0	2
Business	7	4	18	0	8	3
Non-Engineering, Other	17	12	36	4	25	11
Total No. of Cases	(60)	(49)	(11)	(25)	(24)	(1346)
PRESENT JOB FIELD						
Aeronautical Engineering	6	5	10	5	6	7
Civil Engineering	10	13	0	14	11	11
Chemical Engineering	4	5	0	9	0	6
Electrical Engineering	12	13	10	9	17	10
Industrial Engineering	2	0	10	0	0	3
Mechanical Engineering	12	13	10	14	11	12
Engineering, General and Specialties	10	13	0	9	17	29
Physical Sciences or Mathematics	2	3	0	5	0	2
Business	14	13	20	14	11	9
Non-Engineering, Other	28	25	40	23	28	10
Total No. of Cases	(50)	(40)	(10)	(22)	(18)	(1518)

See Items 14 and 15, Scale G in Appendix A for a more complete description of the scale and instruction.

TABLE 10

RELEVANCE OF ENGINEERING BACKGROUND TO FIRST AND PRESENT JOB FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

FIRST JOB RELEVANCE	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Must Have	33	39	9	56	21	37
Very Important	15	18	0	24	13	17
Important	23	22	27	12	33	24
Some Importance	10	10	9	4	17	15
Little Importance	10	10	9	4	17	4
Unnecessary	8	0	45	0	0	3
Total No. of Cases	(60)	(49)	(11)	(25)	(24)	(1351)
PRESENT JOB RELEVANCE						
Must Have	28	30	20	41	17	43
Very Important	10	13	0	18	6	21
Important	30	35	10	32	39	22
Some Importance	14	15	10	5	28	10
Little Importance	6	8	0	5	11	3
Unnecessary	12	0	60	0	0	1
Total No. of Cases	(50)	(40)	(10)	(22)	(18)	(1526)

See Items 14 and 15, Scale H in Appendix A for a more complete description of the scale and instruction.

Table 11; 86% of the total graduates responding voiced some degree of satisfaction (ranging from very satisfied to average satisfaction) with their first job and 88% experienced some degree of satisfaction with their current position. Thirty-three percent of the recent graduates stated they were "very satisfied" with their first job as compared to 16% of the early engineering graduates and 61% of the recent alumni stated they were "very satisfied" with their current position as compared to 43% of the older graduates; none of the recent engineering graduates were dissatisfied with their current job. The satisfactional levels of the recent black graduates surveyed were higher with regard to first and current jobs to those Purdue B.S. engineering graduates surveyed in 1965, but the latter and early black graduates had similar levels of satisfaction.

When comparing the starting salaries of the earlier graduates and the more recent black graduates, significant differences are apparent as may be noted in Table 12. The recent graduate received substantially higher starting salaries than the earlier graduates. The non-engineering graduates of the 1967-74 group had starting salaries that were comparable to the engineering graduates of the same period. The current salary of the earlier engineering graduates shows a marked increase over their initial salaries, $2000/month median compared to $525/month on their first job. The 1967-74 engineering graduates earned substantially more than earlier graduates with the differences being in their initial job being consistently higher over the entire salary range. However, the present salary of earlier black engineering graduates were consistently higher than the recent black graduates. The median salary of all engineers according to the 1974 Survey of the

TABLE 11

GENERAL LEVEL OF SATISFACTION WITH WORK IN POSITION AT FIRST AND CURRENT JOB FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

FIRST JOB LEVEL OF SATISFACTION	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Very Satisfied	23	24	18	16	33	20
Satisfied	35	35	36	32	38	41
Average Satisfaction	28	27	36	40	13	23
Dissatisfied	8	10	0	4	17	13
Very Dissatisfied	5	4	9	8	0	3
Total No. of Cases	(60)	(49)	(11)	(25)	(24)	(1347)
CURRENT JOB LEVEL OF SATISFACTION						
Very Satisfied	49	51	40	43	61	43
Satisfied	29	31	20	24	39	40
Average Satisfaction	10	8	20	14	0	11
Dissatisfied	4	3	10	5	0	5
Very Dissatisfied	8	8	10	14	0	1
Total No. of Cases	(49)	(39)	(10)	(21)	(18)	(1535)

See Items 14 and 15, Scale J in Appendix A for a more complete description of the scale and instruction.

TABLE 12

AVERAGE ANNUAL-MONTHLY SALARY FOR FIRST AND PRESENT JOB OF PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974

FIRST JOB SALARY[1]	ESTIMATED ANNUAL TOTAL[2]	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Lowest	1800	150	150	200	150	500	NA
Lower Quartile (25%)	6120	510	500	700	250	920	NA
Median (50%)	10,800	900	850	975	525	1055	433
Upper Quartile (75%)	13,200	1100	1100	1100	750	1180	533
Highest	30,000	2500	2500	1450	1500	2500	--
Total No. of Cases		(60)	(49)	(11)	(25)	(24)	(1320)
CURRENT JOB SALARY							
Lowest	7080	590	590	704	1250	590	NA
Lower Quartile (25%)	15,120	1260	1300	860	1600	1212	616
Median (50%)	18,120	1510	1600	1260	2000	1300	766
Upper Quartile (75%)	25,200	2100	2100	1550	2700	1600	1185
Highest	54,000	4500	4500	2200	4500	2500	--
Total No. of Cases		(48)	(39)	(9)	(21)	(18)	(1493)

[1]See Items 14 and 15, Appendix A for a more complete description of the instruction and salary information requested.

[2]Estimated on total group to be 12 times the monthly salary.

Engineering Manpower Commission (Engineering Joint Council, 1974) for those with 8 years experience was $17,054. This was over $1000 less than the $18,120 found for Purdue total black engineering graduates, the majority of whom graduated less than 8 years earlier and probably $2000 less than for the Purdue black engineering graduates about half of whom had graduated 8 years earlier. The wide range of beginning annual salaries ranging from $1800 to $30,000 and of current salaries from $7000 to $54,000 attest to the diversity and changes that have characterized the income of black engineering graduates. Salary data of engineering graduates surveyed in 1965 are not comparable and understandably were lower.

Table 13 shows initial positions and current positions of most of the respondents to the questionnaire by undergraduate field. To maintain anonimity of respondents, the year degree attained and names of organizations are deleted; however, it is readily seen that black engineering graduates tend to be in both engineering and non-engineering related jobs with substantial and increased responsibilities when initial and final positions are compared. Most respondents also tended to be working for employers related to their academic major, i.e. aeronautical engineers typically worked in the aircraft industries, electrical engineers were generally employed in the electrical industry or utilities, civil engineers in construction or government, etc. The range of job titled were very diverse also ranging from plant engineer to associate dean and from president of a major oil affiliate to cornerback on a professional foot all team.

Table 14 summarizes the results of a content analysis of the first and current jobs and positions of the black graduates surveyed. Both

TABLE 13

FIRST AND CURRENT JOBS WITHIN FIELD FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974

Field	Year	Initial Job	Present Job
Aeronautical Engineering	1938-66	Engineer	Asst. Dir. of Phys. Plant
		Manufacturing Engineer	Quality Assurance Engineer
		Asst. Engineer Aerodynamics	Scientific Program. Analysis
	1967-74	Control Systems Engineer	Engineer
Chemical Engineering/ Mat. Science Engineering	1938-66	Asst. City Engineer	Advisory Engineer
		Ensign	Technical Program Planning
		Chemical Engineer	Chemical Engineer
		Associate Engineer	Plant Manager
Civil Engineering	1938-66	Naval Architect	Plant Engineer
		Jr. Asst. Sanitary Engineer	Resident Manager
		Highway Engineer	City Engineer
		Highway Designer	Secretary for Educ. Affairs
		Associate Engineer	Materials Manager
	1967-74	Asst. Staff Engineer	Secretary/Treasurer
		Process Design Engineer	Student
		Regional Planner	Graduate Student
Electrical Engineering	1938-66	Project Engineer	Assoc. Dean of Academic Serv.
		Electronics Engineer	Head Product Support
		Assoc. Electrical Engineer	Development Engineer
		Project Engineer	Member of Technical Staff
		Assoc. Professor of Physics	Professor
	1967-74	Project Engineer	Section Supervisor
		Graduate Instructor	Assistant Professor
		Service Representative	Operating Systems Specialist
		Engineer	President
		Sales Engineer	Sales Engineer
		Distribution Engineer	Engineering Analyst
		Marketing Representative	Marketing Representative
		Product Production Engineer	Unit Supervisor
		Technical Staff	Student
		Cornerback	Cornerback
		Ensign	Ensign
		Maintenance Supervisor	Maintenance Supervisor
Industrial Engineering	1967-74	Junior Designer	Junior Designer
		Team Manager	Department Manager
		Second Lieutenant	Second Lieutenant
Interdis. Engineering	1967-74	Second Lieutenant	First Lieutenant
		Quality Control Engineer	Quality Control Engineer
		Design Engineer	Design Engineer
Mechanical Engineering	1938-66	Research Engineer	Program General Manager
		Ordnance Engineer	Manager-Engineering
		Test Engineer	Test Engineer
		Design Engineer	Staff Project Engineer
		Engineer	Product Engineer
		Engineer	Branch Operations Manager
		Design Engineer	President
		Student Engineer	Unemployed
	1967-74	Cost Engineer	Cost Engineer
		Project Engineer	Project Engineer

TABLE 13 (Con't.)

FIRST AND CURRENT JOBS WITHIN FIELD FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-74

Field	Year	Initial Job	Present Job
Technology	1967-74	Process Control Specialist	Second Shift Supervisor
Non-Engineer	1967-74	Revenue Summary Clerk	Revenue Summary Clerk
		Graduate Student in Training	Industrial Engineer
		Management Trainee	Loan Review Analyst
		Systems Analyst	Project Manager
		Employment Assistant	Employment Assistant
		Labor Relations Represent.	College Graduate in Training
		Engineer	Design Engineer

TABLE 14

JOBS AFTER COLLEGE OF PURDUE BLACK AMERICAN GRADUATES
WHO STUDIED ENGINEERING, 1938-1974

FIRST FULL-TIME JOB AFTER COLLEGE Type of Job	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74
Engineering	65	69	45	88	50
Engineering Related	23	24	18	8	42
Non-Engineering	12	6	36	4	8
Total No. of Cases	(60)	(49)	(11)	(25)	(24)
Management	8	8	9	4	13
Semi-Management	10	8	18	4	13
No Management	82	84	73	92	75
Total No. of Cases	(60)	(49)	(11)	(25)	(24)
PRESENT JOB					
Engineering	41	43	33	40	46
Engineering Related	36	40	17	44	38
Non-Engineering	23	17	50	16	17
Total No. of Cases	(61)	(49)	(12)	(25)	(24)
Management	36	38	25	52	25
Semi-Management	18	14	33	8	21
No Management	46	47	42	40	54
Total No. of Cases	(61)	(49)	(12)	(25)	(24)

the initial position and the current position of both earlier and recent graduates tend to be in engineering or engineering related fields, but the current position is more management related, especially for the earlier black graduates.

The results of analyzing the initial jobs and 1974 jobs of Purdue black engineering graduates indicate substantial and increasing technical and management responsibilities. The jobs tend to be engineering and engineering related jobs in which an engineering background is very important. Black graduates hold a wide range of positions, wide variation in salaries received, and the overwhelming majority were satisfied with their 1974 employment

VII. Purdue and Campus Activities

Participation in professional societies topped the list of activities for both the earlier and recent graduates while attending Purdue as shown in Table 15; 71% of the 1938-66 black engineering graduates participated in a professional society activities and 65% of the 1967-74 black engineering graduates compared to 64% in the 1965 Purdue survey. Intramural sports was the second most popular choice of activities among the recent graduates followed by social fraternities, dormitory organizations and club and hobby groups. Over half of 1967-74 graduates participated in the Society of Black Engineers and probably because it was non-existent in the earlier graduates' time, there was very little participation, although 6% stated they participated. Musical, religious and political organizations and student publications were participated in by less than 25% of the black graduates and varsity athletics and drama and debate organizations involved less than 10% of the black graduates surveyed.

TABLE 15

RANK ORDER OF ACTIVITIES IN WHICH PURDUE BLACK AMERICAN GRADUATES PARTICIPATED BASED ON PERCENTAGES

ACTIVITY	TOTAL N	TOTAL 1938-74	ENGR. 1938-74	NON ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Professional Societies	(55)	62	69	30	71	65	64
Intramural Sports	(55)	54	50	73	44	61	60
Social Fraternity	(59)	51	51	50	46	52	64
Dormitory Organizations	(55)	44	42	50	30	50	64
Club and Hobby Groups	(52)	38	20	43	54	32	44
Honorary Societies	(52)	33	36	20	45	27	47
Society of Black Engineers	(49)	31	36	10	6	56	--
Musical Organizations	(54)	13	14	10	5	15	15
Religious Organizations	(55)	24	25	18	35	22	38
Political Organizations	(53)	19	21	10	14	13	8
Student Government	(52)	13	12	20	18	18	15
Student Publications	(53)	13	12	10	15	30	15
Varsity Athletics	(55)	9	11	0	13	9	10
Drama and Debate	(51)	2	2	0	0	8	5

Although only 13% of the respondents actually participated in Purdue's Cooperative Engineering Program as indicated in Table 16, 84% would recommend the Coop program to the current Purdue students. The majority of those participating in cooperative programs felt that the cooperative program was "very important" in financing their education, in understanding practical applications of engineering in industry, in seeing the relevance of academic courses and in deciding whether they wanted to be an engineer.

As may be seen in Table 17, in analyzing the satisfaction level of various aspects of their careers and campus life, it was found that most black engineering graduates seem to be satisfied with their engineering careers and Purdue; engineering, laboratory and mathematics courses and both practical and theoretical courses were rated relatively higher. On the other hand, dating, counseling services, social life, living conditions in Lafayette, tutorial services and opportunity to pursue black studies were areas where there were less than half of the graduates satisfied and substantial proportions were dissatisfied, especially among the earlier graduates.

Factors influencing their decisions to study engineering cited most often as important by the black graduates surveyed were "the type of work" and "interest in problem solving" as shown in Table 18. High school subjects, the prestige of the profession and "independence" (ability to work on their own) also played an important part in influencing graduates to study engineering; 92% of the 1967-74 black engineering graduates stated they were influenced by the "independence" an engineering career offered as compared with only 54% of the 1938-66 group; higher percentages of the more recent compared to earlier graduates indicated "engineering as

TABLE 16

PARTICIPATION IN PURDUE COOPERATIVE ENGINEERING PROGRAM BY PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

PARTICIPATION	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74
Yes	13	14	8	0	29
No	87	86	92	100	71
Total No. of Cases	(61)	(49)	(12)	(25)	(24)
RECOMMEND THE COOP PROGRAM TO CURRENT PURDUE STUDENTS?					
Yes	84	85	80	75	95
No	0	0	0	0	0
Insufficient Information	16	15	20	25	5
Total No. of Cases	(50)	(40)	(10)	(20)	(20)

TABLE 17

SATISFACTION LEVELS FOR VARIOUS ASPECTS OF CAMPUS LIFE FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974 (IN PERCENTAGES)

ASPECT	TOTAL 1938-74			ENGR. 1938-74			NON-ENGR. 1967-74			ENGR. 1938-66			ENGR. 1967-74		
	S	N	D	S	N	D	S	N	D	S	N	D	S	N	D
Engineering Courses	89	10	2	98	2	0	50	42	8	96	4	0	100	0	0
Engineering as a Career When Beginning College	89	8	3	90	8	2	83	8	8	92	8	0	88	8	4
Laboratory Courses	84	11	5	88	8	4	67	25	8	92	8	0	83	8	8
Purdue Today	83	8	8	85	8	6	75	8	17	84	12	4	87	9	4
Engineering as a Career After B.S.	82	12	7	88	4	8	55	45	0	84	4	12	92	4	4
Mathematics Courses	78	15	7	81	13	6	67	25	8	79	13	8	83	13	4
Purdue After B.S.	78	12	10	81	8	10	75	17	8	72	12	16	91	4	4
Practical Courses	77	8	15	80	10	10	67	0	33	84	12	4	75	8	17
Theoretical Courses	74	23	3	78	18	4	58	42	0	76	20	4	79	17	4
Engineering As a Career Today	74	21	5	82	12	6	42	58	0	80	8	12	63	17	0
Purdue When Beginning College	73	17	10	73	17	10	75	17	8	84	16	0	61	17	22
Living Conditions at Purdue	63	20	17	63	21	17	67	17	17	48	20	32	78	22	0
General Education Courses	65	28	7	67	25	8	58	42	0	68	28	4	65	22	13
Career Information	58	17	25	60	17	23	50	17	33	60	8	32	61	26	13
Amount of Financial Aid	53	27	20	56	25	19	42	33	25	46	33	21	67	17	17
Extra-Curricular Activities	45	32	23	48	29	23	23	33	42	44	28	28	52	30	17
Counseling Services	38	34	28	35	41	24	50	8	42	28	40	32	42	42	17
Dating	38	22	40	38	23	40	42	17	42	36	16	48	39	30	30
Social Life	31	28	41	29	27	45	42	33	25	12	36	52	46	17	38
Living Conditions in Lafayette	28	37	35	31	33	35	17	50	33	16	32	52	48	35	17
Freshman Tutorial Services	17	64	19	17	66	17	17	58	25	9	70	22	25	63	13
Black Studies Program	16	55	29	16	57	27	17	50	33	5	55	40	25	58	17

S - Percentage Very Satisfied or Satisfied

N - Percentage Neutral

D - Percentage Dissatisfied or Very Dissatisfied

TABLE 18

FACTORS OF "VERY" OR "SOME" IMPORTANCE FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974, DECISION TO STUDY ENGINEERING (IN PERCENTAGES)

FACTORS	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74
Thought Would Like this Type Work	91	91	91	96	87
Interest in Problem Solving	90	94	75	96	91
High School Subjects	80	86	58	88	83
Prestige of the Profession	75	78	67	80	75
Independence (work on your own)	70	73	58	54	92
Salary of the Profession	67	69	58	64	75
Hobbies	62	63	58	63	63
Interest and Aptitude Tests	58	60	50	63	58
Opportunity to Get Ahead Rapidly	56	55	58	32	79
Security of the Profession	55	52	67	33	71
Teachers in High School	55	58	42	63	54
Being of Service to Others	52	53	50	48	58
Books or Periodicals	53	51	58	43	58
Engr. as a Stepping Stone	49	49	50	20	79
Leadership in the Profession	45	48	33	23	71
Vocational-Educational Infor.	44	47	33	43	50
High School Counselors	44	43	50	30	54
Father	43	48	25	58	38
Mother	41	45	25	39	29
Work Experiences	47	46	50	29	63
Radio, TV, Newspapers	31	25	50	30	21
Visit to an Industrial Plant	22	22	25	13	30
Engineering Students You Know	18	17	25	13	21
Friend Not in Engineering	15	16	8	30	4
Other Relatives	16	15	17	18	13
College Counselors	14	15	8	4	25
Engineers You Have Heard About	25	26	25	17	33
Engineers You Know Personally	12	13	8	13	13
Experience in Armed Services	11	11	8	14	9
Older Brothers or Sisters	7	7	8	5	9

a stepping stone to other careers", "opportunity to get ahead rapidly", "security of the profession" and "work experiences" as important factors in their decision to study engineering. Factors less likely to be rated as important factors in black graduate decisions to study engineering were: visits to industrial plants, engineering students known, college counselors, engineers heard about and known personally, experience in armed services and older brothers and sisters. Non-engineering graduates were less likely to cite problem solving interest, high school subjects and parents as important factors in their original decision to study engineering.

Upon examining factors influencing their decisions to attend Purdue, academic quality, the type of academic program available and the prestige of the institution were most frequently cited as being important. Other factors of considerable importance in decisions to attend Purdue are summarized in Table 19 and include geographical location, physical facilities, variety of programs offered, large institution and parent's encouragement. It appears that teacher's encouragement rather than a pre-college visit to campus had more of an influence on earlier graduates than on the recent graduates. The campus visit was rated as important by only 30% of the earlier in contrast to 60% of the recent graduates. Factors rated as important least often were: college friends, high school friends, special programs available and older brothers and sisters.

Table 20 gives the geographical location of the graduates at various times during their career. The majority came to Purdue from Indiana or other Midwest states, however, they were less likely to remain in Indiana for their first and subsequent jobs, moving to the West and South.

TABLE 19

IMPORTANCE OF DIFFERENT FACTORS FOR PURDUE BLACK AMERICAN GRADUATES WHO STUDIED ENGINEERING, 1938-1974, DECISION TO ATTEND PURDUE UNIVERSITY (IN PERCENTAGES)

FACTORS	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74
Academic Quality of College	95	96	92	92	100
Type of Academic Pro ram in Field	93	94	92	87	100
Prestige of the Institution	92	92	92	91	92
Geographical Location	67	67	67	75	60
Wanted to Go Away to College	66	61	83	54	68
Physical Facilities	63	62	67	59	64
Variety of Programs Offered	62	59	75	54	64
Parent's Encouragement	64	61	75	63	60
Large Institution	54	51	67	50	52
Lower Cost	54	59	33	67	52
Teacher's Encouragement	52	49	67	63	36
Co-Education	49	47	58	33	60
Close to Home	48	48	50	61	36
Counselor's Encouragement	44	39	67	29	48
Pre-College Visit to Campus	43	46	33	30	60
Public Institution	42	47	25	45	48
Other Adult Encouragement	40	35	58	35	36
Received Scholarship/Finan. Aid	49	35	50	33	36
High School Friends	23	22	25	29	16
Special Programs Available	22	19	33	9	28
College Friend	15	15	17	9	20
Only Institution Where Applied/Admit.	7	8	0	17	0
Older Brothers and Sisters	5	6	0	9	4

TABLE 20

GEOGRAPHICAL AREAS IN WHICH PURDUE BLACK AMERICAN GRADUATES LIVED DURING VARIOUS PERIODS UPON GRADUATING FROM HIGH SCHOOL (IN PERCENTAGES)

	TOTAL 1938-74	ENGR. 1938-74	NON-ENGR. 1967-74	ENGR. 1938-66	ENGR. 1967-74	1965 SURVEY
Indiana	54	48	77	56	40	50
Midwest - Other	17	22	0	16	28	29
East	6	6	8	12	0	11
West	0	0	0	0	0	2
South	22	24	15	16	32	5
Outside U.S.	0	0	0	0	0	2
Total No. of Cases	(63)	(50)	(13)	(25)	(25)	(1616)
AREA OF FIRST JOB AFTER B.S.						
Indiana	33	26	58	28	25	25
Midwest - Other	39	43	25	32	54	33
East	8	8	8	12	4	14
West	13	15	8	16	13	14
South	7	8	0	12	4	12
Outside U.S.	0	0	0	0	0	3
Total No. of Cases	(61)	(49)	(12)	(25)	(24)	(1592)
AREA PRESENTLY LIVING						
Indiana	19	16	33	4	28	19
Midwest - Other	24	26	17	16	36	32
East	21	24	8	32	16	14
West	19	20	17	28	12	19
South	15	12	25	20	4	13
Outside U.S.	2	2	0	0	4	3
Total No. of Cases	(62)	(50)	(12)	(25)	(25)	(1614)

VIII. Summary and Conclusions

In summary, it would seem from an analysis of the initial job after graduation and the current (1974) employment of Purdue black engineering graduates that they hold substantial and increasing responsibilities in engineering and management in a wide diversity of industries, government and education. They tend to be employed in areas related to their fields of study, where an engineering background was relevant in both initial and current jobs. Their salaries were varied, but generally substantial and the overwhelming majority were satisfied or very satisfied with their work.

The survey of black engineering graduates indicated that the majority of the respondents have continued their education beyond the B.S. degree. A substantial number have received or expect to receive the master's degree. About one-half plan to continue their education beyond the master's degree.

The Purdue Black American engineering graduates in retrospect seem to be generally quite satisfied with their careers, their engineering courses and their choice of Purdue. Recent black graduates were more likely to be satisfied than earlier graduates with the financial aid available, social life, living conditions, counseling, tutorial services and the current opportunities to pursue black studies.

The primary factors influencing black engineering graduates' decisions to attend Purdue were its academic quality, its prestige and the type of academic program available in engineering. Recent graduates were more apt to feel that the pre-college visit to campus was an important factor in making a decision to attend Purdue and earlier graduates were more apt to cite teacher encouragement. The type of work

involved in engineering, interest in problem solving and high school subjects were most often rated as important factors in decisions to study engineering; recent graduates were more likely to cite engineering as a stepping stone to other careers, rapid advancement opportunities, security, work experiences and independence than earlier graduates as important factors in their decisions to study engineering.

What are the implications of this follow-up study of black engineering graduates? The graduates themselves should be able to take justifiable "black pride" in not only their achievements of high salaries and job satisfaction but in the high technical, supervisory and management responsibilities, as well as their high educational achievements and aspirations. Some graduates commented that "engineering was a tough grind, but worth it". Generally that was the advice to current and future students. The results should be at least a substantial answer to those who may have doubted that black graduates would achieve or be given substantial technical, educational and managerial responsibilities. The evidence seems to be overwhelmingly positive in view of the very high achievements and aspirations reported. To Purdue University staff and students, the data also should give them justifiable pride and the satisfaction that recent changes in campus life and curriculum have resulted in greater levels of satisfaction among black graduates, especially in areas such as financial aid, living conditions at Purdue, counseling, tutoring and black studies opportunities. The implications for the engineering profession, industry and government, in view of their recent commitments and efforts to attract and retain minorities in engineering (Planning Commission for Expanding Opportunities in Engineering, 1974) are also positive. The follow-up study does

indicate that Black Americans who study engineering do have and do achieve high educational attainments. They are assuming substantial technical, supervisory and management responsibilities. They are usually employed in engineering or engineering related activities where their engineering backgrounds are important and in jobs generally quite satisfying for which they earn substantial salaries. One area of possible concern, however, is that a small but significant proportion of the black graduates have pursued non-engineering advanced degrees and have taken on non-engineering positions.

Certainly the data collected in this study indicate that to the extent the results collected in this study are representative, efforts to attract and retain larger numbers and proportions of Black Americans in engineering can be rewarding for all parties concerned including industry, government, higher education, the engineering profession, the black community and society as a whole.

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APPENDIX A

REPLICA OF SURVEY FORM - PERCENTAGE OF PURDUE BLACK 1936-74 ENGINEERING GRADUATES WHO RESPONDED HAS BEEN ADDED TO THE RIGHT OF EACH ALTERNATIVE FOR EACH ITEM (THE NUMBER OF RESPONDENTS OF 50 TOTAL WHO RESPONDED TO EACH ITEM IS GIVEN IN PARENTHESES)

PURDUE ENGINEERING ALUMNI FOLLOW-UP STUDY

The following questions are included for the purpose of gathering additional data to be used for research purposes only. All answers will be kept strictly confidential and your name will not be associated with them.

1. *When did you do your college and university studies?* (If now working on a degree, put "present" under "completed".)

I		BEGAN	COMPLETED			
9-16		___/___ Mo. Yr.	___/___ Mo. Yr.	Bachelor's Degree	1[ ]98% Purdue (49)	2[ ] 4% Other: _____ Location: _____
17-24		___/___ Mo. Yr.	___/___ Mo. Yr.	Master's Degree	1[ ]32 Purdue (25)	2[ ]68 Other: _____ Location: _____
25-32		___/___ Mo. Yr.	___/___ Mo. Yr.	Doctor's Degree	1[ ]36 Purdue (11)	2[ ]64 Other: _____ Location: _____

2. *Which of the following best describes your current educational level and the highest educational level you plan to achieve?*

	CURRENT	PLANNED
	33	34
Some college	1[ ] 0%	1[ ] 0%
Bachelor's degree, no graduate studies	2[ ] 28	2[ ] 5
Bachelor's degree, some graduate work	3[ ] 30	3[ ] 3
Master's degree, no additional graduate work	4[ ] 26	4[ ] 47
Master's degree, some work towards doctorate	5[ ] 6	5[ ] 18
Doctorate	6[ ] 9	6[ ] 13
Other (Specify) _____	7[ ] 2 (46)	7[ ] 13 (38)

3. *What is (or was) your major field in: (Check those that apply)*

	Undergraduate Work	Master's Work	Doctoral Work	
37-42				
	10[ ] 0%	10[ ] 0%	10[ ] 0%	Does not apply or no work
	11[ ] 8	11[ ] 4	11[ ] 0	Aeronautical Engineering
	12[ ] 0	12[ ] 0	12[ ] 0	Agricultural Engineering
	13[ ] 10	13[ ] 7	13[ ] 0	Chemical Engineering
	14[ ] 24	14[ ] 11	14[ ] 11	Civil Engineering
	15[ ] 34	15[ ] 19	15[ ] 22	Electrical Engineering
	16[ ] 8	16[ ] 4	16[ ] 0	Industrial Engineering
	17[ ] 20	17[ ] 4	17[ ] 0	Mechanical Engineering
	18[ ] 0	18[ ] 0	18[ ] 0	Engineering Physics
	19[ ] 2	19[ ] 4	19[ ] 11	Metallurgical and Materials Science
	20[ ] 4	20[ ] 4	20[ ] 0	Other Engineering (Specify) _____
	21[ ] 0	21[ ]	21[ ]	Other (B.S.) _____
	22[ ]	22[ ] 44	22[ ]	Other (M.S.) _____
	23[ ] (50)	23[ ] (27)	23[ ] 56 (9)	Other (Ph.D.) _____

4. *Where did you live during the three periods stated?*

	When You Graduated From High School	When You Received Your First Job After B. S.	At Present
43-48			
1. Indiana	1[ ] 48 %	1[ ] 27 %	1[ ] 16 %
2. Midwest (Ill., Iowa, Kan., Mich., Minn., Mo., N.D., Neb., Ohio, S.D., Wisc.)	2[ ] 11	2[ ] 43	2[ ] 26
3. East (Conn., Mass., Md., N.H., N.J., N.Y., Pa., R.I., Vt.)	3[ ] 6	3[ ] 8	3[ ] 24
4. West (Alaska, Ariz., Cal., Col., Idaho, Hawaii, Mon., N.M., Nev., Ore., Utah, Wash., Wyo.)	4[ ] 0	4[ ] 14	4[ ] 20
5. South (Ala., Ark., D.C., Del., Fla., Ga., Ky., La., Md., Miss., N.C., Okla., S.C., Tenn., Texas, Va., W.Va.)	5[ ] 12	5[ ] 8	5[ ] 12
6. Outside the United States	6[ ] 0 (50)	6[ ] 0 (49)	6[ ] 2 (50)

42

This questionnaire should be returned to: Purdue Engineering Alumni Follow-up Study, Engineering Administration Building, Purdue University, West Lafayette, Indiana 47907.

5. *Have you had any military service, other than reserves or ROTC?* [Check one]

66
1☐ 12% Yes, before college
2☐ 14 Yes, during college
3☐ 14 Yes, after college
4☐ 60 No
(51)

6. *What branch of service?* [Check one]

67
1☐ Does not apply
2☐ Army
3☐ Navy
4☐ Air Force
5☐ Marines
6☐ Other_____

7. *What is your marital status?*

68
1☐ 34% Single
2☐ 60 Married
3☐ 4 Separated
4☐ 2 Divorced
5☐ 0 Widowed
(50)

8. *Do you have any children?* [Check one]

69
1☐ 48% No
2☐ 14 Yes, one child
3☐ 18 Yes, two children
4☐ 20 Yes, three or more _____ How many?
(50)

9. FIRST FULL-TIME JOB AFTER COLLEGE: See Table 13 for an analysis of this question. A representative example is below.

70-71 Name of Employer (or Branch of Service):_____

72 Job Title: Team Manager

73 Briefly describe your duties: I was responsible for a team of 35 technicians and $4 million worth of equipment.

_____

10. PRESENT JOB: See Table 13 for an analysis of this question. A representative example is below.

74-75 Name of Employer:_____

76 Job Title: Department Manager

77 Briefly describe your duties: I am now responsible for 3 team managers, 73 technicians and $12 million worth of equipment.

11. *List any awards, honors, and publications.*

78 52% indicated one or more awards. Representative examples are below.

National Merit Scholar, ASARCO Scholar, Inland-Ryerson Foundation Fellow

_____

12. *Did you participate in the Co-operative Engineering Program while at Purdue?*

79
1☐ 14% Yes Company:_____
2☐ 86 No
(49)

12a. *If yes, how important was the co-op in helping you to:*

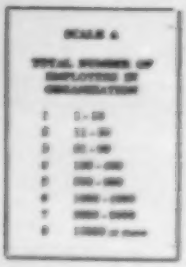
	IMPORTANCE Very 1	Some 2	None 3	Cannot Evaluate 4
80-85				
Decide whether you wanted to be an engineer	☐ 56%	☐ 22%	☐ 11%	☐ 11% (9)
Choose an engineering specialty	☐ 44	☐ 33	☐ 11	☐ 11 (9)
Finance your education	☐ 78	☐ 11	☐ 0	☐ 11 (9)
See the relevance of academic courses	☐ 67	☐ 22	☐ 0	☐ 11 (9)
Understand the practical applications of engineering in industry	☐ 78	☐ 11	☐ 0	☐ 11 (9)
Other:_____	☐ 83	☐ 0	☐ 0	☐ 17 (6)

13. *Would you recommend the Co-op Program to young people attending college now?*

86
1☐ 85% Yes
2☐ 0 No
3☐ 15 Insufficient information
(40)

To answer questions 14 and 15, please refer to the explanation of Employment History Scales below. Please use the scales to classify the type of organization which employed you, your level of responsibility, etc., for (1) your first full-time job (normally, the position you took the year you received your bachelor's degree) and (2) your present job.

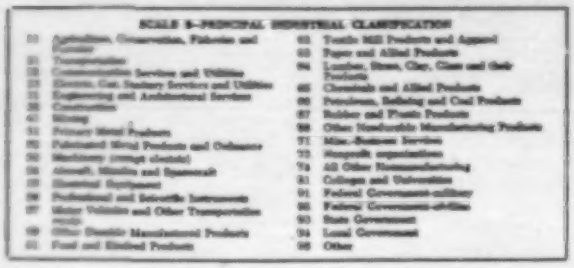
Nine scales are provided below (A through J). From each scale, select the ONE number that best describes the position and enter it in the proper space. In the last column indicate your approximate average monthly salary (before taxes).



SCALE A

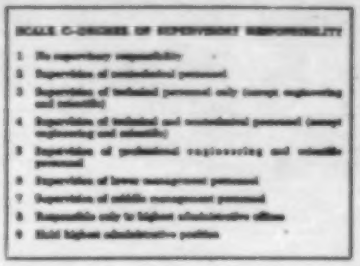
TOTAL NUMBER OF EMPLOYEES IN ORGANIZATION

1 1-10
2 11-50
3 51-99
4 100-499
5 500-999
6 1000-4999
7 5000-9999
8 10000 or more



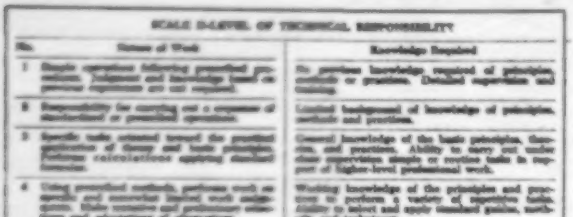
SCALE B-PRINCIPAL INDUSTRIAL CLASSIFICATION

11 Agriculture, Conservation, Fisheries and Forestry
21 Transportation
22 Communication Services and Utilities
23 Electric, Gas, Sanitary Services and Utilities
31 Engineering and Architectural Services
32 Construction
41 Mining
51 Primary Metal Products
52 Fabricated Metal Products and Ordnance
53 Machinery (except electric)
54 Aircraft, Missiles and Spacecraft
55 Electrical Equipment
56 Professional and Scientific Instruments
57 Motor Vehicles and Other Transportation equip.
59 Other Durable Manufactured Products
61 Food and Kindred Products
62 Textile Mill Products and Apparel
63 Paper and Allied Products
64 Lumber, Stone, Clay, Glass and their Products
65 Chemicals and Allied Products
66 Petroleum, Refining and Coal Products
67 Rubber and Plastic Products
68 Other Nondurable Manufacturing Products
71 Misc. - Business Services
72 Nonprofit organizations
74 All Other Nonmanufacturing
81 Colleges and Universities
91 Federal Government-military
92 Federal Government-civilian
93 State Government
94 Local Government
95 Other



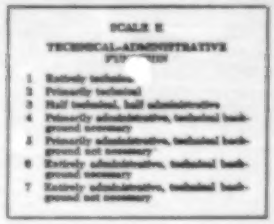
SCALE C-DEGREE OF SUPERVISORY RESPONSIBILITY

1 No supervisory responsibility
2 Supervision of nontechnical personnel
3 Supervision of technical personnel only (except engineering and scientific)
4 Supervision of technical and nontechnical personnel (except engineering and scientific)
5 Supervision of professional engineering and scientific personnel
6 Supervision of lower management personnel
7 Supervision of middle management personnel
8 Responsible only to highest administrative officer
9 Hold highest administrative position



SCALE D-LEVEL OF TECHNICAL RESPONSIBILITY

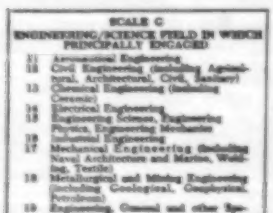
No.	Nature of Work	Knowledge Required
1	Simple operations following prescribed procedures. Judgment and knowledge based on previous experience are not required.	No previous knowledge required of principles, methods or practices. Detailed supervision and training.
2	Responsibility for carrying out a sequence of standardized or prescribed operations.	Limited background of knowledge of principles, methods and practices.
3	Specific tasks oriented toward the practical application of theory and basic principles. Performs calculations applying standard formulas.	General knowledge of the basic principles, theories, and practices. Ability to carry out rather close supervision simple or routine tasks in support of higher-level professional work.
4	Using prescribed methods, performs work on specific and somewhat limited, well established problems. Under routine and professional supervision and adaptation of alternatives.	Working knowledge of the principles and practices to perform a variety of operative tasks. Ability to select and apply standard guides, methods, and techniques.
5	Devises and recommends alternative methods of standardized analysis as a basis for solving problems. Fully independent in operational routine. Requires the solution of difficult or unusual problems.	Good knowledge of standard guides, procedures, methods and techniques in the specialization area. Ability to recognize interrelationships with related engineering activities.
6	Performs a variety of assignments in which complex factors exist as a regular and recurring basis. Interprets, extends, or modifies precedents, procedures, data, methods, or techniques to solve them to develop reasonably new ones.	Thorough knowledge of standard guides, procedures, methods and techniques in specialization area. Ability to function independently under only general supervision.
7	Plans and conducts work requiring planning to arrive at which large blocks of data get controversial or complicated subjects. Proposals for new or additional work are usually originated and accepted on those of an authority.	Thorough and extensive knowledge of the principles, practices, methods and techniques. Ability to plan and organize large-scale assignments involving the development of new lines of approach.
8	Conceives, plans, and evaluates pioneering work of outstanding scope and complexity to completed or terminated encompassing projects as a nationally recognized authority in a specialized field.	Outstanding knowledge of the most advanced and novel developments in the specialty area. Outstanding ability, recognition, creative originality, breadth of vision, and judgment.



SCALE E

TECHNICAL-ADMINISTRATIVE FUNCTION

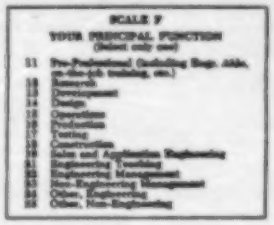
1 Entirely technical
2 Primarily technical
3 Half technical, half administrative
4 Primarily administrative, technical background necessary
5 Primarily administrative, technical background not necessary
6 Entirely administrative, technical background necessary
7 Entirely administrative, technical background not necessary



SCALE G

ENGINEERING/SCIENCE FIELD IN WHICH PRINCIPALLY ENGAGED

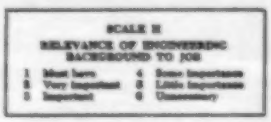
11 Aeronautical Engineering
12 Civil Engineering (including Agricultural, Architectural, Civil, Sanitary)
13 Chemical Engineering (including Ceramic)
14 Electrical Engineering
15 Engineering Science, Engineering Physics, Engineering Mechanics
16 Industrial Engineering
17 Mechanical Engineering (including Naval Architecture and Marine, Welding, Textile)
18 Metallurgical and Mining Engineering (including Geological, Geophysical, Petroleum)
19 Engineering, General and other Specialties
20 Physical Sciences or Mathematics
21 Business
22 Non-Engineering, other



SCALE F

YOUR PRINCIPAL FUNCTION (Select only one)

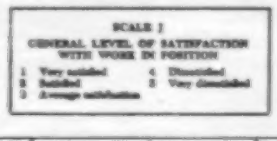
11 Pre-Professional (including Engr. Aide, on-the-job training, etc.)
12 Research
13 Development
14 Design
15 Operations
16 Production
17 Testing
18 Construction
19 Sales and Application Engineering
20 Engineering Teaching
21 Engineering Management
22 Non-Engineering Management
23 Other, Engineering
24 Other, Non-Engineering



SCALE H

RELEVANCE OF ENGINEERING BACKGROUND TO JOB

1 Must have
2 Very important
3 Important
4 Some importance
5 Little importance
6 Unnecessary



SCALE J

GENERAL LEVEL OF SATISFACTION WITH WORK IN POSITION

1 Very satisfied
2 Satisfied
3 Average satisfaction
4 Dissatisfied
5 Very dissatisfied

	Type of Organization		Level of Responsibility		Job Function		Field	Relevance	Satisfaction	Average Monthly Salary
	Scale A	Scale B	Scale C	Scale D	Scale E	Scale F	Scale G	Scale H	Scale J	
14. First job - Year: _____ 67-68	See Table Below 8	See Table Below 9-10	See Table 5 11	See Table 6 12	See Table 7 13	See Table 8 14-15	See Table 9 16-17	See Table 10 18	See Table 11 19	See Table 12 20-23
15. Present job	" 24	" 25-26	" 27	" 28	" 29	" 30-31	" 32-33	" 34	" 35	" 36-39

SCALE A

TOTAL NUMBER OF EMPLOYEES IN ORGANIZATION

		Current Job	First Job
1	1-10	0	0
2	11-50	5	0
3	51-99	10	12
4	100-499	12	12
5	500-999	10	12
6	1000-4999	30	29
7	5000-9999	5	6
8	10000 or more	28	29
		(40)	(49)

SCALE B

PRINCIPAL INDUSTRIAL CLASSIFICATION

		Current Job	First Job
11	Agriculture, Conservation, Fisheries & Forestry	0	0
21	Transportation	2	2
22	Communication Services & Utilities	2	4
23	Electric, Gas, Sanitary Services & Utilities	2	2
31	Engineering & Architectural Services	2	2
32	Construction	2	0
41	Mining	0	0
51	Primary Metal Products	0	0
52	Fabricated Metal Products & Ordnance	2	2
53	Machinery (except electric)	0	2
54	Aircraft, Missiles & Spacecraft	8	12
55	Electrical Equipment	5	12
56	Professional & Scientific Instruments	2	2
57	Motor Vehicles & Other Transportation equip.	2	0
59	Other Durable Manufactured Products	5	4
61	Food & Kindred Products	0	4
62	Textile Mill Products & Apparel	0	0
63	Paper & Allied Products	0	4
64	Lumber, Stone, Clay, Glass and their Products	2	0
65	Chemicals & Allied Products	2	6
66	Petroleum, Refining and Coal Products	5	6
67	Rubber and Plastic Products	2	2
68	Other Nondurable Manufacturing Products	2	0
71	Misc. - Business Services	2	0
72	Nonprofit organizations	0	0
74	All Other Nonmanufacturing	0	0
81	Colleges and Universities	12	4
91	Federal Government - military	0	10
92	Federal Government - civilian	2	0
93	State Government	2	2
94	Local Government	2	2
95	Other	10	6
		(40)	(49)

16. For each type of extra-curricular activity listed below, please indicate the degree of your participation during college by placing check marks under as many of the column headings as apply.

	Did not Participate	Participated	Held Minor Office	Held Major Office			SPECIFY ACTIVITY
	1	2	3	4			
40-54	☐ 89%	☐ 9%	☐ 0%	☐ 2%	(45)	Varsity athletics	
	☐ 50	☐ 48	☐ 2	☐ 0	(46)	Intramural sports	
	☐ 79	☐ 10	☐ 7	☐ 5	(42)	Student government	
	☐ 58	☐ 21	☐ 12	☐ 9	(43)	Dormitory organizations	
	☐ 49	☐ 13	☐ 9	☐ 30	(47)	Social fraternity	
	☐ 79	☐ 16	☐ 0	☐ 5	(43)	Political organizations	
	☐ 75	☐ 21	☐ 2	☐ 2	(44)	Religious organizations	
	☐ 57	☐ 33	☐ 7	☐ 2	(42)	Club and hobby groups	
	☐ 88	☐ 9	☐ 0	☐ 2	(43)	Student publications	
	☐ 64	☐ 29	☐ 2	☐ 5	(42)	Honorary societies	
	☐ 31	☐ 64	☐ 2	☐ 2	(45)	Professional societies	
	☐ 64	☐ 31	☐ 0	☐ 5	(39)	Society of Black Engineers	
	☐ 98	☐ 2	☐ 0	☐ 0	(41)	Drama and debate	
	☐ 86	☐ 11	☐ 2	☐ 0	(44)	Musical organizations	
	☐ 73	☐ 12	☐ 4	☐ 12	(26)	Other	

17. About how much of your time did you work for self support during your college or university career? (Check those that apply)

	B.S. Work	M.S. Work	Ph.D. Work	
55-57	1☐ 17%	1☐ 11%	1☐ 55%	Does not apply
	2☐ 21	2☐ 15	2☐ 18	None
	3☐ 33	3☐ 7	3☐ 9	1/4 time (1-10 hrs./wk.)
	4☐ 10	4☐ 15	4☐ 0	1/2 time (11-20 hrs./wk.)
	5☐ 4	5☐ 7	5☐ 0	3/4 time (21-30 hrs./wk.)
	6☐ 13	6☐ 37	6☐ 9	Full-time (31-40 hrs./wk.)
	7☐ 2	7☐ 7	7☐ 9	Overtime (40+ hrs./wk.)
	(48)	(27)	(11)	

18. What was your major source(s) of support during your college or university career? (Check those that apply)

	B.S. Work	M.S. Work	Ph.D. Work	
58-69	☐ 0% (49)	☐ 4% (49)	☐ 8% (49)	Does not apply
	☐ 37 (49)	☐ 12 (49)	☐ 10 (49)	Fellowship-Scholarship
	☐ 29 (49)	☐ 2 (49)	☐ 0 (49)	Loan-Government
	☐ 6 (49)	☐ 2 (49)	☐ 0 (49)	Loan-Personal
70-72	☐ 47 (49)	☐ 2 (49)	☐ 0 (49)	Parents
3				
9-10	☐ 14 (49)	☐ 6 (49)	☐ 2 (49)	GI Bill
	☐ 25 (49)	☐ 2 (49)	☐ 0 (49)	Savings
	☐ 2 (50)	☐ 6 (50)	☐ 4 (50)	Teaching
	☐ 6 (50)	☐ 6 (50)	☐ 4 (50)	Spouse
19-22	☐ 25 (49)	☐ 14 (49)	☐ 4 (49)	Work (on campus)
23-25	☐ 33 (49)	☐ 12 (49)	☐ 2 (49)	Work (off campus)
26-28	☐ 33 (49)	☐ 4 (49)	☐ 0 (49)	Other (Specify)
29-31	☐ 2 (49)	☐ 6 (49)	☐ 0 (49)	Other (Specify)

(Name)

19. *How satisfied were (are) you with each of the following:*

	Very Satisfied 1	Satisfied 2	Neutral 3	Dis-satisfied 4	Very Dis-satisfied 5		
							WHILE AT PURDUE:
52	2%	27%	27%	31%	14%	(49)	Social life
	13	35	29	19	4	(48)	Extra-curricular activities
	10	27	23	25	15	(48)	Dating
	10	69	10	10	0	(49)	Practical courses available
	16	71	8	2	2	(49)	Laboratory courses available
57	16	61	18	2	2	(49)	Theoretical courses available
	8	58	25	6	2	(48)	Liberal Arts and General Education courses
	29	69	2	0	0	(49)	Engineering courses
	10	50	17	17	6	(48)	Career information available
	27	54	13	6	0	(48)	Mathematics courses
62	6	29	41	16	8	(49)	Counseling services
	19	44	21	10	6	(48)	Living conditions at Purdue
	8	23	33	25	10	(48)	Living conditions in Lafayette
	2	15	66	15	2	(47)	Tutorial services available in Freshman Eng
	2	14	57	14	14	(44)	Opportunity to pursue Black Studies Program
	15	42	25	10	8	(48)	Amount of financial aid available to you
							ENGINEERING AS A CAREER OR MAJOR:
68	41	49	8	2	0	(49)	When you entered college
	43	45	4	8	0	(49)	When you received your B.S. degree
	47	35	12	4	2	(49)	Today
							PURDUE UNIVERSITY:
71	33	40	17	10	0	(48)	When you entered college
	31	50	8	8	2	(48)	When you received your B.S. degree
11	42	44	10	4	0	(48)	Today

20. *How important was each of the following in your decision to study engineering?*

	IMPORTANCE Very 1	Some 2	Little 3	None 4		
54	20%	25%	29%	27%	(49)	Mother
	23	25	23	29	(48)	Father
	4	2	11	82	(45)	Older brothers or sisters
	9	7	15	70	(46)	Other relatives
	7	9	14	70	(43)	Friend not in Engineering
59	2	11	13	75	(47)	Engineers you know personally
	11	15	21	53	(47)	Engineers you have heard about
	4	13	13	71	(48)	Engineering students you know
	19	40	15	27	(48)	Teachers in high school
	13	30	23	34	(47)	High school counselors
64	2	13	15	70	(47)	College counselors
	35	25	13	27	(48)	Interest and aptitude tests
	15	32	21	32	(47)	Vocational-educational information
	19	32	21	28	(47)	Books or periodicals
	6	19	28	47	(47)	Radio, T.V., newspapers
69	42	31	13	15	(48)	Independence (work on your own)
	25	27	29	19	(48)	Security of the profession
	25	31	27	18	(49)	Opportunity to get ahead rapidly
	17	30	30	22	(46)	Leadership in the profession
	15	31	25	29	(48)	Work experiences
74	45	41	6	8	(49)	High school subjects
	31	31	8	29	(48)	Hobbies
	7	15	26	52	(46)	Visit to industrial plant
	4	7	9	80	(45)	Experience in armed services
78	27	22	12	39	(49)	Engineering as stepping stone
4 0	54	40	4	2	(48)	Interest in problem solving
	55	36	9	0	(47)	I thought I would like the type of work
	29	41	18	12	(49)	Salary of the profession
	33	45	12	10	(49)	Prestige of the profession
	16	37	31	16	(49)	Being of service to others
13	86	0	0	14	(7)	Other_____

21. *What would you recommend to a close friend or relative regarding:*

	Definitely Recommend	Probably Recommend	Probably Not Recommend	Definitely Not Recommend
19-45	1	2	3	4
An engineering career	☐ 49%	☐ 49%	☐ 6%	☐ 0% (49)
Attending Purdue University	☐ 52	☐ 48	☐ 0	☐ 0 (48)

22. *The list below includes a number of factors which people consider when they choose a college/university. For each reason listed, place a check to indicate the extent to which it influenced your decision to attend the institution from which you received your bachelor's degree.*

	IMPORTANCE					
	Very	Some	Little	None		
	1	2	3	4		
16	☐ 33%	☐ 35%	☐ 12%	☐ 20%	(49)	Geographical location
	☐ 23	☐ 25	☐ 25	☐ 27	(48)	Close to home
	☐ 39	☐ 22	☐ 12	☐ 27	(49)	Wanted to go away to college
	☐ 84	☐ 12	☐ 2	☐ 2	(49)	Academic quality of college
20	☐ 31	☐ 29	☐ 12	☐ 29	(49)	Lower cost
	☐ 56	☐ 35	☐ 4	☐ 4	(48)	Prestige of the institution
	☐ 73	☐ 21	☐ 2	☐ 4	(48)	Type of academic program in my field
	☐ 20	☐ 27	☐ 22	☐ 31	(49)	Coeducation
24	☐ 19	☐ 28	☐ 26	☐ 28	(47)	Public institution
	☐ 30	☐ 32	☐ 21	☐ 17	(47)	Physical facilities
	☐ 18	☐ 33	☐ 27	☐ 22	(49)	Large institution
	☐ 25	☐ 35	☐ 22	☐ 18	(49)	Variety of programs offered
28	☐ 37	☐ 25	☐ 16	☐ 22	(49)	Parent's encouragement
	☐ 22	☐ 27	☐ 22	☐ 29	(49)	Teacher's encouragement
	☐ 12	☐ 27	☐ 20	☐ 41	(49)	Counselor's encouragement
	☐ 10	☐ 25	☐ 27	☐ 38	(48)	Other adult encouragement
32	☐ 8	☐ 14	☐ 22	☐ 55	(49)	High school friends
	☐ 4	☐ 2	☐ 11	☐ 83	(47)	Older brothers and sisters
	☐ 21	☐ 25	☐ 15	☐ 40	(48)	Pre-college visit to campus
	☐ 6	☐ 8	☐ 17	☐ 69	(48)	College friend
36	☐ 13	☐ 6	☐ 29	☐ 52	(48)	Special programs available
	☐ 22	☐ 12	☐ 18	☐ 47	(49)	Received scholarship and/or other financial aid
	☐ 4	☐ 4	☐ 10	☐ 81	(48)	Only institution where applied or admitted
44	☐ 56	☐ 0	☐ 0	☐ 33	(9)	Other (Specify)_____

23. *Which of the following best describes your feeling about this questionnaire? (Check as many as apply)*

48 ☐ 11% (50) Enjoyed it
☐ 62 (50) Did it because it seemed worthwhile
☐ 2 (50) Some of the questions too personal (Numbers:_____)
☐ 2 (50) Some questions repetitious (Numbers:_____)
☐ 2 (50) Some questions irrelevant (Numbers:_____)
49 ☐ 2 (50) Did not enjoy it

24. *Comments or advice you wish to pass on to students who plan to study engineering at Purdue?*

46 70% made comments on the questionnaire. A representative example is below.

Every prospective engineering student should evaluate his background in mathematics and basic sciences and correct any deficiencies. One must keep the time devoted to social life in perspective with study time. Related summer jobs can be very beneficial in defining career objectives.

25. *In what way, if any, have you found that engineering can benefit the Black Community?*

47 84% made comments on the questionnaire. A representative example is below.

The input of ideas from the Black perspective is important to many industries today. Black engineers along with other Black professionals serve as an inspiration to the youth who need successful people to guide them.

26. *Please feel free to make any comments or suggestions below:*

57 QUESTIONNAIRE: 34% made comments on the questionnaire. A representative example is below.

Good idea to get background information and impressions from those who have successfully completed the engineering program at Purdue. These facts can help identify general attitudes, impressions, experiences and help clarify both the good and the bad in so far as the black experience at Purdue is concerned

58 ENGINEERING EDUCATION AT PURDUE: 54% made comments on the questionnaire. A representative example is below.

Generally my only complaint was that very little of the practical uses of the theory being taught was introduced into the course work. This I realize was limited by the enormous amount of theory that had to be covered. Perhaps an applications electives series of courses could be offered.

59 ENGINEERING AS A CAREER: 46% made comments on the questionnaire. A representative example is below.

Engineering offers a challenging career opportunity with many sub-careers ranging from the highly technical (research and design) to the less technical (sales and application). Engineering is an excellent springboard to other careers such as management, law, etc.

OPPORTUNITIES FOR BLACK PEOPLE IN ENGINEERING AND SCIENCE: 60% made comments on the questionnaire. A representative example is below.

I feel Blacks have tremendous opportunities in technical fields. Earnings can be quite substantial and acceptance by whites (co-workers and clients) has been universally good. Opportunities to rise to the highest levels in business may not yet be granted.

60 OTHER: 34% made comments on the questionnaire. A representative example is below.

As the Black student population of the university increases the retention of students should improve. Improved contact with good technically oriented high school students should help lure greater numbers of Blacks into engineering at Purdue.

OPTIONAL: *If you have a recent photograph of yourself, we would like to have one for our files.*

Thank you for taking the time to complete this questionnaire.

This questionnaire should be returned to: Purdue Engineering Alumni Follow-up Study, Engineering Administration Building, Purdue University, West Lafayette, Indiana 47907.

PURDUE UNIVERSITY *West Lafayette, Indiana 47907*

Office of the President
317-749-2106

As part of a comprehensive effort to evaluate programs and services available to minority engineering students, Purdue is currently engaged in conducting a study of current and former engineering students. At Purdue and nationally, there is a concern over the low proportion of Black Americans entering and graduating in the field of engineering. While Purdue has instituted a number of programs to aid minority students who are interested in engineering, it is of vital importance that we continually assess the strengths and weaknesses of the engineering programs.

To give you a better idea of some of the things being done at Purdue, we are enclosing a copy of the "Cornerstone", the latest copy of a publication by the Society of Black Engineers.

We would appreciate any suggestions you might have on how Purdue can attract and retain more minorities in engineering. Also we are interested in any career information you can share with us.

Your individual responses to the questionnaire will be kept strictly confidential.

We appreciate your participation in this important study.

Sincerely,

Arthur Hansen, President
Purdue University

John Hancock, Dean
Schools of Engineering

Arthur Bond, Coordinator
Black Engineering Programs